

**Forward Emitters for increased coupling of laser
produced x-rays to targets
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Conventional laser heated hohlraums efficiently convert laser light into x-rays. However geometric considerations limit the fraction of x-radiation which can be coupled to a target with good uniformity. Typically, the overall coupling efficiency is ~10-20% of the laser energy. We discuss a different type of source of laser produced x-rays; a "forward emitter" (defined below). On NIF it may be possible to significantly increase x-ray coupling efficiency with packed arrays of 24 to 48 such sources arranged to conform to the target. For example, with planar targets there's a potential 3-8X increase in energy coupling. For spherical targets the coupling could rise from ~14% to 25-33% with good uniformity and up to 50% with reduced uniformity. Forward emitter: An x-ray source with the following properties:

- *Converts laser energy incident from, say, the left, into x-rays emitted to the right with efficiencies of >50%.
- *Capable of x-ray emission intensities >200eV
- *Has a high albedo to incident radiation from other sources.
- *Is relatively short along the direction in which it radiates x-rays.
- *Operates at powers <~10-20TW, to allow packed arrays of such sources with NIF. Work performed under the auspices of the U.S. Department of Energy by the Lawrence Livermore National Laboratory under Contract W-7405-ENG-48.